# Inflatable Air Mattress

## Background

[0001] This invention relates to an inflatable mattress. More particularly, the invention is a foldable, lightweight, portable, firm, and easy to inflate and deflate mattress. It includes an outer shell and an inner chamber, which has one inlet and one outlet.

[0002] The traditional inflatable mattress comes in different configurations. The original inflatable mattress is a single outer chamber filled with air. It is difficult with this type of mattress to provide an even and firm support for its user. An improved inflatable mattress resolves this problem by using a plurality of cylindrical sub-chambers inside the outer chamber. However, it is very difficult to repair the multiple enclosed sub-chambers once one sub-chamber leaks. Furthermore, these inflatable mattresses use the same valve for the air's inlet and outlet. Due to this design, it usually takes a long time to deflate the mattress, forcing the user to inconveniently place pressure on the deflating mattress in order to squeeze the remaining air out.

## Summary

[0003] This invention obviates these above-mentioned problems of traditional inflatable mattresses, and provides users with a more even and firm mattress that can be quickly inflated or deflated. The invention includes an outer shell and an installable internal chamber, which has a separate air inlet and outlet. The inside of the outer shell has a plurality of internal I-beam separators, intended to divide the inner space of the outer shell into separate parallel pathways. These pathways share two common conduits, one

locates at the front openings and one locates at the back openings of these pathways. Because both conduit ends of the outer shell have a zipper, it is easy to insert the longitudinal inner chamber through the pathways from one end of the outer shell to the other end of the outer shell. Once the inner chamber is in place, it is easy to inflate or deflate it through the corresponding inlet or outlet valve located at opposite tip-ends of the inner chamber. Both valves of the inner chamber include a tube-like opening mounted on the outside of the inner chamber, a removable rubber cork, and a protection cap that can be screwed on the end of the tube.

[0004] The structure of the mattress provides an even distribution of air pressure inside the inner chamber and the outer shell. With a zipper at both sides of the outer shell, the inner chamber can easily be installed or removed. With separate valves for the inlet and outlet, a user can effortlessly inflate or deflate the mattress.

Brief Description of the Drawings

[0005] Following drawings with reference numbers and exemplary embodiments are referenced for explanation purpose.

[0006] Figure 1 illustrates a perspective side view of this invention's air mattress.

[0007] Figure 2 illustrates the inner structure of the outer shell with the built-in parallel I-beam separators.

[0008] Figure 3 illustrates the detail structure of the inlet and the outlet valves.

[0009] Referring to Figures 1, 2 and 3, the mattress of this invention includes an outer shell (1), and an inner chamber (2), which can be inserted into the outside shell. The inside of the outer shell holds a plurality of built-in parallel I-beam separators and has two common conduits, one located at the font openings and another located at the back openings of the parallel pathways. In addition, the outside shell has zippers installed at the outer shell sides next to these common conduits, where the mattress can be unzipped in order to access the inside conduit and the inner pathways' openings. A user can insert one end of the longitudinal inner chamber into the opening of the first pathway at one side of the outer shell, all way through the pathway and comes out at the other end of that pathway. Then the user can turn the rest of the inner chamber around in the conduit area, and insert it back into the consecutive pathway. By operating the same way, the user can continuously run the inner chamber through all internal pathways of the outer shell to the other side of the outer shell. Because the inner chamber is made from an expendable, durable, and flexible PVC material, therefore, it is easy to turn or twist the inner chamber along these pathways.

[0010] The inlet valve (3) and the outlet valve (4) are located at opposite longitudinal tip-ends of the inner chamber, which are easily accessible through the open zippers. The inlet of the inner chamber is intended to be a standard inlet. It is automatically closed, but will open when air is forced in via a pump. Once the inflation is finished, the user can put a rubber cork into the tube-like opening to prevent any air leakage from the inner chamber. The outlet valve (4) includes a tube-like opening (41), a rubber cork (42) which is inserted into the tube-like opening , and a protection cap (43), which can be screwed into

the end of the tube-like opening (41). The protection cap can further prevent the rubber cork from popping out due to pressure from the inner chamber. In one embodiment, the outer shell can be made with a cotton-like material with 7-13 built-in separators. As discussed before, the conduit-sides of the outer shell has a zipper installed, where it can be opened to insert or remove the inner chamber. In addition, if the inner chamber becomes damaged, the user can easily remove the inner chamber for repair or replacement. The I-beam separators in the outer shell can be made from fabric material, since the purpose of the separations is to provide a guided pathway for the inner chamber. For cosmetic purposes, sponge or similar material can be added to the sides of the outer shell for comfort.